WHAT IS CLAIMED IS:

1. A method for growing a silicon film by liquid phase epitaxy on a surface of a substrate in contact with a solution containing at least silicon by decreasing a temperature of the solution, comprising the steps of:

forming a bulk portion having substantially no void; and

forming a surface portion having plural protrusions that overhang in a lateral direction.

2. The method for growing a silicon film according to claim 1, wherein a temperature decreasing rate of the solution in the step of forming the surface portion is larger than a temperature decreasing rate of the solution in the step of forming the bulk portion.

3. The method for growing a silicon film according to claim 1, wherein the plural protrusions that overhang in the lateral direction have at least one of surfaces and insides which have planes of almost the same inclination.

4. The method for growing a silicon film according to claim 1, wherein a multicrystalline silicon substrate is used as the substrate.

5. The method for growing a silicon film according to claim 1, wherein the surface portion of the silicon film has a void which does not communicate with the outside.

6. A method for manufacturing a solar cell comprising the method for growing a silicon film according to claim 1, further comprising the step of:

forming a P-N junction on the silicon film obtained by the growing method.

7. A semiconductor substrate comprising an inclined plane and plural grooves of a gap portion communicated with the inclined plane in a surface layer composed of silicon.

8. A semiconductor substrate comprising a surface portion having an inclined plane affected by a crystal structure of silicon and plural protrusions that overhang in a lateral direction in a surface layer composed of silicon,

wherein plural grooves having openings narrowed due to the protrusions overhanging in the lateral direction are formed in the surface portion.

9. The semiconductor substrate according to claim 8, wherein the inclined plane is (111) surface

or (100) surface of a silicon crystal.

10. The semiconductor substrate according to claim 8, wherein a width of the opening of each groove is 0.1 to 50 μm.

11. The semiconductor substrate according to claim 8, wherein a vertical depth from the opening of each groove to a deepest end of each groove is 5 to 100 μm.

12. A solar cell comprising the semiconductor substrate according to claim 8 as a component,

wherein a P-N junction is formed on the surface layer composed of silicon.

13. A solar cell comprising a collector electrode crossing over the plural grooves on the semiconductor substrate according to claim 8.